Have you renewed your subscription?

ENTOMOLOGICAL NEWS

DECEMBER 1944

Vol. LV **No. 10**

CONTENTS

Dawson & Blevins—Butterflies of the mountains of eastern Arizona 253
Conant—No joy in an insect-free world 258
Rockefeller Report for 1943 259
Richards—Electron micrographs of mosquito microtrichiae 260
Hull—Notes upon flies of the genus Solva 263
Leech—Addition to Blackwelder's Checklist of beetles 266
Notes and News in Entomology 268
Entomological Literature 272
Index 281

PUBLISHED MONTHLY, EXCEPT AUGUST AND SEPTEMBER, BY
THE AMERICAN ENTOMOLOGICAL SOCIETY
PRINCE AND LEMON STS., LANCASTER, PA.
AND
THE ACADEMY OF NATURAL SCIENCES, PHILADELPHIA 3, PA.

Subscription, per yearly volume of ten numbers: $3.00 domestic; $3.30 foreign; $3.15 Canada.
Entered as second-class matter April 19, 1943, at the post office at Lancaster, Pa., under the Act of March 3, 1879. Acceptance for mailing at the special rate of postage prescribed for in Section 1, Act of October 3, 1917, authorized January 15, 1921.

ENTOMOLOGICAL NEWS

ENTOMOLOGICAL NEWS is published monthly, excepting August and September, by The American Entomological Society at 1900 Race Street, Philadelphia 3, Pa., U. S. A.

PHILIP P. CALVERT, Editor Emeritus. Editorial Staff: E. T. CRESSON, JR., E. J. F. MARX, J. A. G. REHN, A. G. RICHARDS, JR., and R. G. SCHMIEDER.

Subscription price, per yearly volume of 10 numbers: Domestic, $3.00; Foreign, $3.30; Canada, $3.15—U. S. Currency.

SUBSCRIPTIONS, ADVERTISEMENTS: All communications and remittances to be addressed to **ENTOMOLOGICAL NEWS, 1900 Race Street, Philadelphia 3, Pa.**

ADVERTISING RATES: Full width of page. Payments in advance.

	1 Inch	2 Inches	3 Inches	6 Inches
One Issue	$1.00	$ 1.90	$ 2.75	$ 4.80
Five Issues	4.50	8.50	12.00	21.00
Ten Issues	8.00	15.00	21.00	36.00

MANUSCRIPTS and all communications concerning same should be addressed to **A. G. Richards, Jr., Zoological Laboratory, University of Pennsylvania, Philadelphia 4, Pa.**

The receipt of all papers will be acknowledged and, if accepted, they will be published as soon as possible. If not accepted, authors will be so advised and postage requested for return of manuscripts. Articles longer than six printed pages may be published in two or more installments, unless the author is willing to pay for the cost of a sufficient number of additional pages in any one issue to enable such an article to appear without division.

Proof will not be sent to authors, so manuscripts must be in final form for printing.

ILLUSTRATIONS will be published at the author's expense as follows: Cost of engraving plus cost of printing text-figures exceeding 2 inches in height; or plus cost of printing insert plates. The size of text-figures or plates when printed must not exceed 4 x 6 inches.

All blocks will be sent to authors after publication. It is not advisable to print half-tones as text-figures.

TABLES: Authors will be charged the setting of all tables exceeding 2 inches in height.

SEPARATA: Twenty-five extras of an author's contribution will be given free. They will be "run of form," without removal of extraneous matter, folded but not bound, uncut and without cover.

Authors wishing more than the 25 separates must so advise the Editor or the printer. See bottom of this page. The Editor requests that authors state the number of separates desired in a letter accompanying their manuscript.

SEPARATES of articles without covers, without extraneous matter, will be furnished by the printer at the following prices: 1–4 pages, 25 copies, $2.50; 50 copies, $2.50; 100 copies, $3.00. 5–8 pages, 25 copies, $4.00; 50 copies, $4.00; 100 copies, $4.75. 9–12 pages, 25 copies, $6.25; 50 copies, $6.25; 100 copies, $7.25. Covers: first 50, $2.75; additionals at 2 cents each. Plates, printed on one side: first 50, $2.00; additionals at 1½ cents each. Transportation charges will be extra. THE LANCASTER PRESS, INC., Lancaster, Pa.

ENTOMOLOGICAL NEWS

VOL. LV DECEMBER, 1944 No. 10

Some Butterflies of the Mountains of Eastern Arizona

By E. YALE DAWSON and T. B. BLEVINS

The authors had opportunity during the 1936 and 1937 summers of abundant rubber and gasoline to visit a number of excellent butterfly collecting areas in eastern Arizona, mostly at fairly high altitudes where the lepidoptera were at the peaks of their flights in late June. Some of the comparatively inaccessible mountain regions had seldom been visited by entomologists and promised to yield interesting species for the quest. The species noted in this account are not all of those taken, but represent the more significant, or the more unusual species of particular localities, records of which it is hoped will be of interest to other collectors who may thereby be encouraged to explore these regions more fully for lepidoptera in post-war times. The determinations have all been checked and verified by the junior author and agree with the McDunnough check list of Dec., 1937, except for forms very recently described.

Fresnal Canyon at 2300 feet on the western slope of the Baboquivari range was already quite dry and brown by June 5, and the more ephemeral spring butterflies were mostly gone. Around mesquite trees and desert acacia bushes, however (nasty for netting), *Apodemia palmerii* was abundant, occasionally accompanied by *Atlides halesus* wherever the desert mistletoe (*Phoradendron*) occurred on the mesquite. *Danaus berenice strigosa* soared lazily about as *Asterocampa antonia, Anthanassa texana, Antigonus pulverulenta, Melitaea perse* and *Pholisora ceos* flitted through openings in the shrubbery, occasionally alighting on late flowering composites. On a moist

spot of sand near the drip of a water pipe, a great number of *Leptotes marina* congregated, now and then joined by *Eurema mexicana, Polygonus amyntas arizonensis,* or *Libythea bachmanii.* The latter species was only occasional there, although at some seasons in that part of Arizona it migrates in immense swarms. Thousands of these butterflies were seen late one August clinging to shade trees in the town of Gila Bend.

At about 4000 feet on the slope of the mountain, we took considerable numbers of *Megisto rubricata* as they flew up from clumps of dry grass.

During the second week of June we collected around the west base of the Santa Catalina range just north of Tucson, finding, near the town of Oracle (app. 5000 ft.) *Celotes nessus, Atrytonopsis lunus, A. edwardsi, Strymon oslari* and *Apodemia mormo deserti,* usually associated with a yellow bush composite. A second visit some two weeks later saw us netting an abundance of *Strymon leda ines, Hemiargus isola* and *Copaeodes aurantiaca* which flew in numbers about the opening flowers of the large clumps of desert acacia.

On the upper slopes of the Santa Catalina range (7000 ft.), where steeply inclined canyons were wooded with oaks, *Neonympha henshawi* and *Megisto rubricata* were common, flitting through the shady groves and hiding themselves from time to time by alighting on the dry, brown leaves covering the sloping ground. Out on the sunny ridges we found *Chiodes albofasciatus* and took *Basilarchia astyanax arizonensis* on the wing, but it was not until we reached the edge of the pine belt at about 7500 feet that we encountered the really excellent collecting. We were fortunate to find the *Ceanothus* bushes in full flower, attracting by their sweet, pungent aroma a host of insects that settled on the flower clusters to become stupified by the intoxicating sweetness. Forceps proved a far better tool than a net, for, from the community of insects on each inflorescence, it was possible to select exactly the desired specimens and stealthily to remove them without disturbing the other unsuspecting attendants at the gluttonous feast. In this manner we chose for our day's catch some excellent series of *Apodemia*

nais, Anthanassa texana, Poanes taxiles, Amblyscirtes cassus, A. exoteria, Callophrys apama and *Erora quaderna sanfordi* (described by Clench, 1942). *Hypaurotis chrysalus* showed now and then a flash of its dazzling purple wings above the scrub oaks, but evaded capture. *Thorybes pylades* formed a community centering around a slope covered with wild pea vines (*Vicia*).

The pine groves and moist stream beds of the mountain top were less abundantly inhabited by butterflies, but at some advantageous places *Papilio daunus, Neophasia terlootii* and *Eurema mexicana* could be taken on the wing with a skillfully handled net, as they flew through the glades. *Erynnis pacuvius,* a great rarity, was also taken.

On the way toward a visit to the Chiricahua mountains we stopped to spend a few hours in Miller's canyon on the lower slopes of the Huachuca range (4000 ft.). The canyon was dry and the forest floor deep with fallen leaves from which an abundance of *Megisto rubricata* and *Neonympha henshawi* were aroused and driven into our nets. These species had the peculiar habit of flying after dusk, and that evening several satyrs were attracted to our light traps along with over a thousand moths. *Heterochroa bredowii, Papilio daunus, Anaëa aidea, Euptoieta claudia* and *Basilarchia astyanax arizonensis* were also to be had, but required much more active handling of the net.

At Rustler's Park in the Chiricahua mountains (7500 ft.), the early morning sunbeams had hardly broken through the forest before skippers appeared on the woodland sunflowers, still heavy with dew, and among the wild iris patches in the small clearings. *Poanes taxiles* arose early, followed by *Amblyscirtes bellus, A. cassus* and *A. exoteria.* By mid-day we found a dripping spring whose moist, sunny borders attracted the skippers, including *Butleria polingii,* as well as considerable numbers of *Paramecera xicaque. Euptoieta claudia* and *Eurema mexicana* occasionally settled to rest, but were usually on the wing as was *Basilarchia weidemeyerii angustifascia.*

For real thrills, a butterfly hunter should enter the White mountains of Arizona from Clifton on the south, during the last week of June. The variety and abundance of butterflies to be had within the short distance from the lower sonoran desert country to the boreal heights is little short of fantastic. We found *Nathalis iole, Euptoieta claudia* and *Phyciodes picta* on Mesquite flowers as we started into the mountains. At 3500 feet, most of the vegetation was already dry, but a few remaining blossoms yielded *Melitaea theona bollii* to our nets. At 5000 feet however, we again encountered the sweet, fragrant *Ceanothus* in full flower, and there, as in the Catalina mountains, its intoxicating honey drew a multitude of butterflies to the heavily scented bushes. All of the following species were to be had in excellent numbers, although the first three were in predominance: *Apodemia nais, Callophrys apama, Erora quaderna sanfordi, Chlosyne lacinia crocale, C. lacinia nigrescens, Atrytonopsis deva, Butleria pirus, Amblyscirtes cassus, Nathalis iole.* At 6000 feet, *Papilio daunus, Basilarchia weidemeyerii angustifascia, B. astyanax arizonensis, Eurema mexicana* and *Heterochroa bredowii* were on the wing and best captured as they crossed the open road, for the shrubbery is both dense and continuous at this altitude. The *Ceanothus* flowers here were especially frequented by the blues: *Plebeius icarioides lycea, Glaucopsyche lygdamus arizonensis,* and *Lycaenopsis pseudargiolus cinerea arizonensis.* At 7000 feet, near Stray Horse Camp, we succeeded in netting the wary *Hypaurotis chrysalus* and also found *Cecropterus cellus, C. pseudocellus, Pieris napi pseudonapi, Poanes taxiles, Hesperia uncas* and *H. pahaska williamsi.*

In mid-afternoon a sudden overcasting of the sky and chilling drop in temperature foretold of an approaching storm, and for a time it appeared that our butterfly collecting was over. As we drove on a way, however, we came to one of the marginal clearings of the extensive, mountain meadows called Hannagan's (app. 9000 ft.). It was filled with yellow sunflowers and to our astonishment, we found that actually thousands of butterflies had been feeding in the field during the sunny afternoon

and now, immobilized by the cold, were still resting on the flowers. Two species were dominant: *Euphydryas magdalena* and *Melitaea pola arachne*. Of these we indeed reaped a rich harvest, all with our forceps, selecting and rejecting specimens at will until the abounding field was deluged by the anticipated rain.

Next day we returned to this meadow to find the butterflies no longer stiff and stupified, but very much alive and active. Having nearly satisfied ourselves as to the two species captured in such abundance the day before, we largely ignored them in favor of the many others new to our nets. *Colias alexandra edwardsi, Argynnis nausicaa* and *A. eurynome luski* were the more spectacular inhabitants of the meadows, but by the end of the day our nets had swept up *Phyciodes nycteis drusius, P. mylitta pallida, Coenonympha ochracea subfusca, Butleria polingii, Euptoieta claudia, Polygonus amyntas arizonensis, Mitoura spinatorum, M. siva, Erynnis persius frederickii* (described by Freeman, 1939), *Minios charon, Plebeius aquilo rustica, Pieris napi pseudonapi, Papilio daunus, P. rutulus arizonensis* and many others.

From Hannagan's Meadow, Mount Thomas rises 1500 feet to mark the highest point of the range, and in search of the rare *Erebia magdalena* we set out for its boreal heights. *Polites draco, Hesperia nevada, Coenonympha ochracea subfusca* and *Oarisma garita* were taken on the upward trail, but at the summit a snow storm struck and drove us back to camp. Rains drenched the mountains and our search for *Erebia magdalena* ended fruitlessly, though our captured treasure of other species had already far exceeded our most optimistic hopes. Perhaps a reader of this account will chance upon its peak of flight should he strike out for the thrills of the butterfly quest in the Arizona mountains as we did. Whichever of these or other mountain ranges of this varied state he may chose to visit, splendid catches of rare butterflies in this grandly scenic region will surely beacon his early return. Good hunting!

No Joy in an Insect-Free World

By Roger Conant, Curator, Philadelphia Zoological Gardens

[The following letter appeared in the Philadelphia Evening Bulletin on October 4, 1944. It is reproduced here with the permission of the author, and at the request of the editors. Actually we suspect that the wholesale devastation of all insects will not be brought about by the much-advertised DDT, but the ecological or conservation point of view should always be kept in mind in connection with such "dreams."—The Editors.]

An item appeared on the editorial page of The Bulletin a few days ago about the use of the new insecticide DDT. It was concerned with the fact that the Pennsylvania Department of Agriculture recently sprayed a 20-acre tract of forest land in Lackawanna County with this substance and that inspections made two and four months later showed that all gypsy moths had been killed—also all flies, mosquitoes, and other insects.

The value of DDT is inestimable. We have heard how its use enabled the American authorities to eliminate typhus-carrying lice from the citizens of Naples, thus preventing a disastrous epidemic. We have heard how DDT may be expected to perform miracles when the war is over and it is available for civilian use. Much is promised, for it appears that after an object is sprayed any insect which touches it during a period of several months thereafter will be killed.

In private homes, hotels, restaurants, fur storage vaults, stables, and similar places DDT probably will be invaluable, but I should like to mention an important fact which has attracted the interest of many scientific minds but which, to the best of my knowledge, has not yet been called to the attention of the public. Unless this insecticide is used with caution it can become a very dangerous boomerang.

Many insects are unmitigated pests, but the wholesale slaughter of the harmful kinds, in the fashion employed in the Lackawanna County forest, also kills all other insects—even beneficial types and those which are of no economic value. Insects, good and bad, are the staff of life of millions of songbirds. They nourish the trout and bass which are so esteemed by sportsmen, and they help to feed other animals of economic

importance—such as the skunk, an important fur bearer. Indirectly they furnish provender for innumerable other animals.

If fields and forests are sprayed on a wholesale scale, what is to become of the bee industry? And, most important of all, what about the insects which pollinate the plants? We could raise mighty few fruits and vegetables indeed were it not for the hordes of insects which, in their travels, carry pollen from one plant to another.

I am confident that the manufacturers of DDT and the wildlife and agricultural authorities are aware of the serious potentialities of this insecticide, as well as they are aware of its encouraging benefits. I simply would like to point out the above facts to your readers who, in a burst of enthusiasm, might be tempted to use DDT indiscriminately as soon as it is on the market. A farmer or suburban gardener could very well ruin his crop or flower bed if he used this product without exercising care and followed directions precisely. If an insect-free world is every achieved, mankind probably will not be on hand to witness and enjoy it.

Rockefeller Foundation in 1943

In the annual report for 1943 the Rockefeller Foundation records the re-discovery of *Anopheles gambiae* in Brazil. This time, however, this most dangerous malarial vector was found in planes arriving from Africa and around airport buildings. The situation was handled promptly before the species became established. The immediate danger is over, but the incident emphasizes the danger attendant upon the establishment of international air service. Public health must become even more international and airplane inspections be most rigid if serious introductions and outbreaks are to be avoided.

The Foundation also announces re-opening of its yellow-fever laboratory at Lagos, West Africa. This laboratory is to serve as a center for distributing yellow-fever vaccine and as a consultative headquarters. This laboratory has considerable historic significance since it was here that yellow-fever vaccine was first prepared and cultures obtained which furnish all the current vaccines.

Electron Micrographs of Mosquito Microtrichiae

By A. Glenn Richards, Jr., Zoological Laboratory,
University of Pennsylvania

It is rather generally recognized that a considerable variety of cuticular details lies beyond the range of resolution of the light microscope. In the last several years it has been possible to examine some of these structures with the high resolution RCA electron microscope.[1] The details revealed are sometimes quite unexpected. Recently, incidental to some other work, an entire wing of the malarial mosquito, *Anopheles quadrimaculatus* Say, was examined. Somewhat to our surprise the wing membrane

proved to be so extremely thin that the detailed structure of the minute microtrichiae arising from the wing surface could be observed directly. High magnification electron micrographs were taken of approximately a dozen of these.[2] One entire microtrichia and the distal portion of another were traced to get the line drawings reproduced here at a magnification of 10,000 ×.

Stereo pictures show that the microtrichiae chosen for tracing are lying flat and accordingly are favorable for measuring. The entire microtrichia is about 10 microns long, and tapers from 0.57 micron at the base to about 0.12 micron at the rounded tip. The most striking feature is the ringed appearance due to circular thickenings around the shaft. These show most distinctly because of the crenulate edge they give in silhouette, but dark bands across the microtrichial pictures at these points in-

[1] See Journ. N. Y. Entom. Soc., 50: 147–167, 245–247, 1942; Journ. Morph., 71: 135–183, 1942; Journ. Applied Physics, 13: 748–758, 1942; Sci. Monthly, 55: 187–192, 1942.

[2] Stereoscopic electron micrographs taken by Dr. R. G. Picard of RCA.

dicate that, as one would expect, the thickenings go all the way around the shaft. Usually the rings are placed at right angles to the axis of the microtrichia but in some regions the rings appear slightly tilted to the axis of the shaft. Nevertheless they are clearly rings and not a helix ("spiral"). The thickened rings have a spacing of 0.1 to 0.2 micron but their elevation from the shaft is only some 0.015 to 0.03 micron.[3]

The base of each microtrichia is surrounded by an irregular area of greater density. On the probable assumption that the chemical material is the same (or of the same density), this indicates that each microtrichia arises from an area of slightly thicker membrane. It is not desirable to attempt an estimate of the thickness of the mosquito wing membrane from these pictures. Clearly, though, the great transparency to 60 kilovolt electrons shows the membrane must be extremely thin, probably considerably less than 0.1 micron for the sum of upper and lower membranes. The thickened areas at the bases of the microtrichiae are considerably thicker and may be as much as 0.25 micron.

In an analysis of iridescent wing scales of butterflies we noted,[4] "It may be a coincidence, but it seems remarkable that so many structures in the scales, the vanes, the supporting rods and the supporting membrane, too, are crossed by thickenings 0.12 to 0.20 micro apart." Analyses of physical colors in insects (Süffert, Mason, etc.) show that spacings of this magnitude and somewhat larger are common throughout many insect groups. Now we find similar spacings on mosquito micro-

[3] Annulated shafts, however, are not found on the microtrichiae of all insects. Electron micrographs of microtrichiae from the wings of a housefly and a thrips show smooth edges. Likewise, electron micrographs of setae from various sources (*e.g.*, mosquito larvae) show smooth edges. Data obtained with the light microscope deal only with variations of a greater magnitude but one can say that such annulated shafts seemingly have not been recorded (see summary by Ferris, Can. Entom., 66: 145–150, 1934).

[4] T. F. Anderson & A. G. Richards, Jr., Journ. Applied Physics, 13: 748–758, 1942. A brief non-technical digest of this was given in Entom. News, 55: 190–193, 1944.

trichiae. As we suggested, these periodic thickenings probably do not represent a molecular spacing as such but they may well be related to the mode of deposition of the material.[5]

The discovery that similar spacings are found in iridescent and colorless structures leads one to inquire how spacings of similar magnitude may in one case produce color, in another case not. Such "submicroscopic" spacings conceivably might not result in the production of color because (1) the spacings may be below the minimum necessary to produce interference effects (0.19 micron); (2) the spacings may be hidden or improperly oriented; (3) the parts may be so constructed and distributed that color effects are not produced; or (4) the part may be too opaque for the spacings to be effective. Examples of all of these possibilities have now been found with the electron microscope.

We are faced by the fact that a wide variety of cuticular parts of entirely different gross structure show spacings in this range but not of exactly the same measurement. This fact may perhaps be interpretable in terms of imbibition or similar phenomena. It is well-known that various chemicals (water and certain organic liquids) cause different degrees of swelling (imbibition) with resulting change of color in insect cuticles. It is possible that some fundamental spacing, general throughout insect cuticles, is modified by the addition of other substances to give the slightly different spacings found in different insects.

In the past this problem has been studied by analysis of the interference effects (colors) sometimes produced; this indirect method is highly accurate in certain respects but is limited in scope. In the electron microscope we have an instrument with which this problem can be studied directly for a fairly wide range of cuticular structures. It is interesting to see how generally systematic spacings are found in insect structures, both colored and colorless, and to note how many of them fall within this narrow range.

[5] A much smaller, possibly molecular framework was found in butterfly scales. This meshwork showed lines only approximately 0.006 micron wide and 0.02 micron apart.

Notes Upon Flies of the Genus Solva Walker

By F. M. Hull, University of Mississippi

Four species of flies belonging to or close to the genus *Solva* Walker, have been collected by the author in Mississippi. Two of these appear to be undescribed. Three of these species present certain differences from the genotype of *Solva* and for them I erect a new subgenus. Ten species of *Solva* have previously been described from North America, several of which appear to be wide-spread.

Genus *Solva* Walker

Phloophila new subgenus

Eyes bare. Males dichoptic. Antennae set a little below the head in profile as in *Solva*. Third antennal segment with eight annuli. Body more compact than in *Solva*. Hind femora in all the known species considerably enlarged and bearing rows of small teeth upon the ventral surface. Wings with venation in general similar to *Solva* but with the vein M_3 and the vein Cu_1 arising from the same point; the vein M_3 sometimes evanescent. All the veins strongly microsetate above and in some cases below, in contrast to the limited distribution upon the first two or three veins in *Solva*.

Subgenotype: *pallipes* Loew.

Both Leonard * and Malloch * have previously called attention to the differences between *pallipes* and the other species of *Solva*. Malloch pointed out that the larvae and pupae of *pallipes* Loew present characteristics justifying its separation.

Phloophila crepuscula new species

This species is related to *pallipes* Loew in the black teeth upon the hind femora but is quite distinct in the very different, shorter and rather swollen antennae, as well as the entirely black, oval more widened abdomen, and the venational difference.

Male. Length 4.5 mm. *Head:* the vertex, front and face are black; the eyes are margined with white pubescence and

* Leonard, M. D., Rev. of N. Amer. Rhagionidae, page 43 (1930); Malloch, M. R., Bull. Ill. St. Lab. of Nat. Hist., Vol. XII, art 3, p. 341 (1917).

white pile that expands inwardly and gradually upon the lower half of the front leaving the middle bare. The pile of the face and front and vertex is silvery. The antennae are dark brown upon the first joint and light brownish-yellow upon the second and almost white upon the ventral and medial surfaces of the remaining apical part; the apical and dorso-lateral surface of which is blackish; the antennae are much shorter and considerably wider, especially upon the basal half of the third joint, than in *pallipes* Loew. *Thorax:* quite convex and rounded and shining black with short, appressed, whitish pile which has a very faint, scarcely noticeable yellowish tinge. The humeri, sides of the pleura below the mesonotum and the broad middle of the scutellum are pale yellow. The sides and base of the scutellum are blackish. *Abdomen:* broader, wider, more oval and more flattened than in *pallipes* and wholly shining black except for the usual, transverse, basal, oval, yellowish, non-chitinized area that lies below the metanotum. Halteres pale yellow. *Legs:* including the coxae, but excepting the extreme base of the hind coxae and the last three tarsal joints, entirely pale whitish-yellow. The distal tarsal joints are pale brown, the base of the hind coxae dark brown. Pile of the legs pale except for a double row of very short, black, tooth-like spines along the outer ventral margin of the hind femora upon the distal half. *Wings:* hyaline, the veins dark brown. The vein M_3, or the second section of the fifth longitudinal vein, is reduced and it fails by nearly half its length to reach the margin.

Female. Uniformly larger, measuring 6.5 mm.; similar in every respect to the male except for larger size and still broader and more oval abdomen.

Holotype: a male, allotype female, two paratype males and eleven paratype females, all taken at the University, Mississippi, upon windows in May, and usually in the late afternoon during the years 1940–42.

Phloophila pygmea new species

This species is related to *pallipes* Loew and differs in the differently shaped and colored antennae, and the dark brown, black tipped palpi.

Female. Length 4.5 mm. *Head:* the front, face and vertex are black, the front has an appressed band of whitish pile, the hairs directed towards the midline above and this band is divergent upon the lower half of the front until it reaches the eye margin at the base of the antennae. The hairs of the two sides intercross upon the upper half of the front. Palpi dark brown with black tip. The antennae are elongate and rather slender but less tapering than in *pallipes* Loew. *Thorax:* moderately convex and shining black with sparse, appressed, whitish-yellow pile which is not conspicuously formed into bands or stripes as it is in *pallipes*. The humeri, the lateral margins of the thorax just below the mesonotum and the scutellum except very narrowly upon the base and narrowly on the sides, are brownish-yellow. *Abdomen:* rather short and moderately broad; it is shining black with extremely slender, yellow margins upon the posterior margin of the third and fourth segments and with a trace of these upon the second segment. The sixth and seventh segments are entirely shining black without the yellow spots characteristic of *pallipes*. *Legs:* pale yellow, the apices of the hind femora are very narrowly brown, the distal tarsal joints light brown. The hind femora are more slenderly thickened than in *pallipes* and have two rows of very tiny, black, spine-like teeth upon the outer ventral margin almost as far as the base. *Wings:* greyish hyaline, the veins dark brown, the venation similar to *pallipes*.

Holotype: a female. Oxford, Mississippi, May, 1941.

The antennae upon the medial and ventral surfaces are dark reddish-brown instead of whitish-yellow, the remainder of the antennae is brownish-black.

Phloophila pallipes Loew

This species is almost always abundant late in every spring season and is commonly found on windows.

Solva americana Wiedemann

Twenty-six specimens of this fine species have also been collected at Oxford, Mississippi, upon laboratory windows, in May. Of them only two were females.

A Few Additions and Corrections to R. E. Blackwelder's "Checklist of the Coleopterous Insects of Mexico, Central America, the West Indies, and South America. Part I" [1]

By HUGH B. LEECH, Vernon, British Columbia

On page 2 of his most useful checklist [2] Blackwelder requests the publication of any additions and corrections noted by its users. Upon comparing the pages listing water beetles (*Haliplidae, Dytiscidae, Gyrinidae, Limnebiidae* and *Hydrophilidae*) with my monograph of the water beetles of Lower California (*in press,* California Academy of Sciences), it appears that at least 20 species, all from Baja California, should be added.[3] Bibliographical references are not given here, as Dr. Blackwelder will cite all literature in full in the last part of his checklist.

†**Canthydrus lineatus* Horn 71–329. Type locality is Baja California.

†*Canthydrus levis* Fall 09–161. Type locality is Baja California.

†**Desmopachria dispersa* Crotch 73–388. Type locality is Baja California.

†*Bidessus cinctellus* LeC. 52–206. Recorded from Baja California by Horn 94–313.

†*Bidessus amandus* LeC. 52–207. Recorded from Baja California by Horn 94–313.

†**Hygrotus fraternus* LeC. 52–209. Recorded from Baja California by Horn 96–368.

†**Deronectes addenda* Crotch 73–393. Type locality is Baja California.

[1] Contribution No. 2321, Division of Entomology, Science Service, Department of Agriculture, Ottawa, Canada.

[2] Smithsonian Institution, Washington, D. C., United States National Museum Bulletin 185, pp. xii + 188, 1944.

[3] Species preceded by an asterisk (*) I have seen from Baja Calif.; those by (†) are additions to Blackwelder's list.

†**Deronectes funerea* Crotch 73–392. Type locality is Baja California.

†**Copelatus chevrolati* Aubé 38–389. Recorded from Baja California by Horn 94–314.

†*Agabus regularis* LeC. 52–203. Recorded from Baja California by Horn 94–314.

Rhantus anisonychus Crotch 73–409. Recorded from Baja California by Grossbeck 12–324. He was not certain of the identification.

†*Rhantus flavogriseus* Crotch 73–409. Recorded from Baja California by Horn 94–314.

**Thermonetus basillaris* Harris 29–1, is the correct spelling of the specific name, and the correct bibliographical reference.

Hydaticus bimarginatus Say 31–5. Recorded by Horn 96–368; probably based on a misidentification.

Cybister elliptica LeC. 52–202. Recorded from Baja California by Horn 94–315; thought to have been misidentified.

†*Thermonetus*[4] *peninsularis* Horn 94–362. Type locality is Baja California.

†**Ochthebius interruptus* LeC. 52–210. Recorded from Baja California by Horn 90–23.

†*Helophorus lecontei* Knisch 24–88. Listed (as *H. obscurus* LeConte) by Horn 94–315, from Baja California.

Berosus infuscatus LeC. 54–365. The citation should be 55–365.

†**Berosus rugulosus* Horn 73–124. The type was from Baja California.

Berosus salvini Sharp 82–79 and *B. hoplites* Sharp 87–765 are distinct species, and not, as Knisch (1922) claimed, subspecies of *punctatissimus* LeConte.

"*Berosus stramineus* Say 25–188" is an unfortunate mixture of two citations,

One should be: *Berosus stramineus* Knisch 22–124,

the other: *Berosus striatus* Say 25–188.

Tropisternus laevis mergus Say 37–171. The citation should be 35–171.

[4] Blackwelder uses this generic name as if it were of feminine gender, though by his own rules (1941–138) it must be masculine.

Tropisternus ellipticus LeC. 54–368. The citation should be 55–368; several other LeContean species of 1855 are cited as of 1854. But see the reference to *Tropisternus sublaevis* LeConte on p. 171.

†**Tropisternus salsamentus* Fall 01–214. Recorded from "Basse Californie" by d'Orchymont, 1922.

Chaetarthria. The generic name is credited to Stephens 1835–401. I believe it can be given an earlier date, Stephens 1833, Nomencl. British Ins., ed. 2, p. 22.

Paracymus dibilis Sharp, should be *debilis.* Blackwelder separates the genera *Paracymus* and *Anacaena,* but d'Orchymont (1933: 302–304) points out that on the basis of the world fauna the two are virtually inseparable. In fact d'Orchymont would place *debilis* Sharp in *Anacaena.*

†**Anacaena signaticollis* Fall 24–87. This was listed (as *infuscatus* Mots.) from Baja California by Horn 94–317.

†**Helochares normatus* LeC. 61–341. Recorded from Baja California by Horn 73–126; 90–252; 94–316.

†*Helochares maculicollis* Mulsant 44–379. Recorded from Baja California by Horn 96–368.

†*Cymbiodyta dorsalis* Motschulsky 59–177. Recorded from Baja California by Horn 94–316.

Phaenonotum estriatum Say. I am a little puzzled by the spelling of the specific name. The species was originally described by Say 35–171, as *Hydrophilus exstriatus.* Why Blackwelder should prefer the LeContean emendation *estriatum* when he does not, for instance, accept Dejean's emendation *Thermonectus* of his own 1833 *Thermonetus,* is hard to understand. If the spelling *estriatum* is to be used, the reference would be to LeConte 53–36, rather than to 55–373 (not 54–373).

Cercyon rufescens Horn 95–233. Described as from Baja California.

Notes and News in Entomology

Under this heading we present from time to time short reviews, notes, news and comments about entomology and entomologists. Contributions from readers are earnestly solicited. The editors wish more readers would contribute to this section. Trivial notes are commonly the most interesting reading.

The Classification of Entomologists: The classification of entomologists made by Brunnich in 1764, recently unearthed by Dr. H. B. Weiss and reprinted in the May number of the "News" is quaint but not without interest to the present-day entomologist. However, Dr. Weiss aptly comments that Brunnich's distinctions do not hold at the present time, and the classification needs to be completely revised and modernized.

I have often thought that a classification of entomologists should be made, but it should be made on the simple basis of the degree of imagination possessed by them rather than on the basis of their special interests. There are imaginative entomologists and those without imagination, and one needs only to page through the volumes of any present-day journal of that field to be able to sort one from the other.

I had not gone far, however, with my meditations on such a classification when I discovered that Oliver Wendell Holmes had already done the job for me. While of course he did not mention entomologists, his three category classification fits aptly in that field. He says: "There are one-story intellects, two-story intellects, and three-story intellects. All fact collectors, who have no aim beyond the facts, are one-story men. Two-story men compare, reason, generalize, using the labors of the fact-collectors as well as their own. Three-story men idealize, imagine, predict * * *."

Other writers have their similar ideas about the unimaginative person. W. Somerset Maugham, in his book "On a Chinese Screen," after describing the haphazard writings of a certain journalist, says: "He had seen everything at haphazard * * *. He was the field naturalist, who patiently collects an infinity of facts, but has no gift for generalization; they remain facts that await the synthesis of minds more complicated than his own. His collection was unrivalled but his knowledge of it slender. He had an insatiable curiosity. But I think his experiences were merely of the body and were never translated into experiences of the soul * * *. That was certainly why with so much to write about, he wrote tediously, for in writing, the important thing is less richness of material than richness of personality."

Aldous Huxley likewise has a word for the man of imagination. "Without imagination, without sensitiveness, it would be impossible to be a successful man of science. It would be difficult to find a great scientific man who has not been touched by a sense of wonder by the strangeness of things."

A portrait of a man of imagination may be found in the writings of Robert G. Ingersoll. Says he: "A man of imagination, —that is to say, of genius,—having seen a leaf and a drop of water, can reconstruct the forests, the rivers and the seas. Really, to know one fact is to know its kindred and neighbors. Shakespeare, looking at a coat of mail, instantly imagined the society, the conditions that produced it, and what it produced."

The adoption of the three category classification of Holmes would be a boon to entomology. Many rising students of the science eager to graduate into the "three-story" class, would encourage the development and make full use of the imagination in their researches, and produce works perhaps as great or even greater than those of Darwin, Bates, Wallace, Forel, Fabre and Wheeler, all of whom have made fullest use of their powers of imagination.—But after all, one must not permit his own imagination to grow too robust in this expectation. PHIL RAU.

Fireflies Active in Rain: Although such records may exist, I cannot recall ever having seen in print, the fact, so well known to many, that fireflies are active during moderate evening showers. Most nocturnal insects do not fly about while it is raining, but I have often noted *Photinus marginellus* Lec., and *Photuris pennsylvanica* DeG., flying leisurely during moderate June rains. Our standard texts are not explicit about this matter. Many fail to note this characteristic activity of the Lampyridæ. True, Comstock's "Introduction to Entomology" mentions the activity of Lampyridæ on warm, moist evenings, but such a statement gives one the impression of dampness, rather than of actual rain. I have never seen them flying during a heavy, beating downpour, but many are not deterred by moderate showers, and after the shower they appear in larger numbers.—H. B. WEISS.

Permanent "Sleeping" Quarters of Chalybion cæruleum (Linn.), (Sphecidæ, Hymen.): Every summer, from the middle of June, through August, over a period of five years, small

aggregations (10 to 15) of the blue mud-dauber wasp, *Chalybion cæruleum* (Linn.) have used the same inside corner of a cloth awning, on the porch of my house, for a roosting place during the night. This corner is formed where the sloping top and the front and side pieces meet. Through five consecutive summers, the same awning has been in place and every day from 30 minutes to an hour before sunset individuals would arrive singly and after some preliminary flying and crawling over the awning, finally settle in the corner close to one another. On cloudy afternoons they would appear earlier. On sunny mornings they had left before I appeared on the scene, but when the weather was cloudy and cool or raining they would remain until such conditions had disappeared.

The other corner of the same awning and other corners of adjoining awnings were never selected. As September approached, the number of individuals in the sleeping aggregation declined to five or six, and even during the summer nights the number was not always constant, but varied from night to night between 10 to 15. The selection of the same "sleeping" quarters year after year by different individuals seems to indicate that this particular corner possesses an odor that does not disappear from the end of one summer to the beginning of another, and that is renewed each summer by a new "sleeping" aggregation.—HARRY B. WEISS.

An unusual faunistic study: While making an index to the first fifty volumes of the Journal of the New York Entomological Society, my attention was attracted by the paper entitled, "A contribution to the study of the fauna of the grave. A study of one hundred and fifty disinterments, with some additional experimental observations," by Murray Galt Motter. This was published in Volume VI, No. 4, p. 201–231, Dec., 1898, and shows the findings on human cadavers interred from one to seventy-one years within the city limits of Washington, D. C. These findings belonged chiefly to the Acarina, Thysanura, Coleoptera and Diptera. This is a subject that has not received much attention from American entomologists, due, no doubt, to obvious difficulties inherent in such a study. For this reason many years will no doubt elapse before much is added to our present knowledge in this field.—H. B. WEISS.

Current Entomological Literature

COMPILED BY THE EDITORIAL STAFF.

Under the above head it is intended to note papers received at the Academy of Natural Sciences of Philadelphia and the University of Pennsylvania, pertaining to the Entomology of the Americas (North and South), including Arachnida and Myriopoda. Articles irrelevant to American entomology will not be noted; but contributions to anatomy, physiology and embryology of insects, however, whether relating to American or exotic species will be recorded.

This list gives references of the current or preceding year unless otherwise noted. Continued papers, with few exceptions, are recorded only at their first installment.

For records of Economic Literature, see the Experiment Station Record, Office of Experiment Stations, Washington. Also Review of Applied Entomology, Series A, London. For records of papers on Medical Entomology, see Review of Applied Entomology, Series B.

NOTE: The figures within brackets [ ] refer to the journal in which the paper appeared, as numbered in the List of Journals given at the end of the literature. The number of the volume, and in some cases, the part, heft, &c. is followed by a colon (:). References to papers containing new forms or names not so stated in titles are followed by (*); if containing keys are followed by (k); papers pertaining exclusively to Neotropical species, and not so indicated in the title, have the symbol (S).

Papers published in ENTOMOLOGICAL NEWS are not listed.

GENERAL—(See also under Special.) **Allan, P. B. M.**—Some notes on hibernating larvae I. [9] 77: 125–6 (cont.). **Beltran, E.**—El problema de las classificaciones zoologicas y la ensenanza de la zoologia. [35] 5: 83–98. **Birkmann, G.**—Obituary. [68] 99 (2580): 463. **Boyden, A.**—Systematic relationship in animals. [129] 89: 568. **Bridges, C. B.**—Mutants of Drosophila melanogaster. Completed and edited by Katherine S. Brehme. 257 pp., 128 text figs., 3 pls. Carnegie Inst. of Wash., Publ. 552. 1944. Review by Th. Dobzhansky in [68] 100: 52. **Bruch, Carlos.**—Obituary. 1873–1943. Bibliography. [106] 169–83, port. **Dendy, J. S.**—Fate of animals in stream drift when carried into lakes. [27] 14: 333–57. **Dorsey, C. K.**—Mosquito survey activities at Camp Peary, Virginia. [7] 37: 376–387. **Evens, E. D.**—Method for fixing insects with legs, etc., extended. [Microscope] 5: 211. **Herms, William Brodbeck.**—Biography. [Mosquito News] 4: 38, 46–47, port. **Jaeger, E. C.**—Source-book of biological names and terms. [C. C. Thomas, Springfield, Ill., 256 pp., ill.] **Pierce, W. D.**—Entomophobia. [38] 43: 78–80. **Sevastopulo, D. G.**—Prepupational travel. [9] 77: 107–9. **Smart, J.**—Handbook for the identification of insects of medical importance. [Brit. Mus. Publication] 269 pp., ill., 1943. **Smith & Kelly.**—Thirteenth or 1943 annual insect population summary of Kansas. [103] 17: 81–98. **Turner, H. J.**—Terminology in natural science. [21] 56: 69–70, 79–80. **Wadley & Wolfenbarger.**—Regression of insect in-

tensity on distance from center of dispersion as shown by a study of the smaller European bark beetle. [47] 69: 279–88. **Wolcott & Martorell.**—Seasonal cycle of insect abundance in Puerto Rican cane fields. [Jour. Agr. Univ. P. Rico] 27: 85–104, ill., 1943.

ANATOMY, PHYSIOLOGY, MEDICAL—Augustson, G. F. (See under smaller orders.) **Barnes, H. F.**—Studies of fluctuations in insect populations. X. Prolonged larval life and delayed subsequent emergence of the adult gall midge. [97] 12: 137–38. **Beall, G.**—Multiple generation Pyrausta nubilalis on plants other than corn in Ontario. [29] 74: 13–15. **Blewett & Fraenkel.**—Intracellular symbiosis and vitamin requirements of 2 insects, Lasioderma serricorne & Sitodrepa panicea. [Proc. R. Soc. London, B] 132: 212–21. **Brown, J. H.**—Sylvatic plague. A note on the probable relationship of flea index to epizootic plague in ground squirrels in Alberta. [13] 36: 70–71. **Caspari, E.**—Action of the gene A on the tryptophane metabolism of Ephestia kühniella. [129] 89: 545. **Colton, H. S.**—Anatomy of the female American lac insect, Tachardiella larrea. [Bull. Museum of Northern Ariz.] 21: 1–24, ill. Abstract in [129] 89: 573. **Cook, Wm. C.**—Studies of the vitality of the beet leafhopper during the fall and winter in California, as related to the fat content of the insects. [84] 25: 327–40. **Davidson, J.**—On the relationship between temperature and rate of development of insects at constant temperatures. [97] 13: 26–38. **Dobzhansky & Epling.**—Contributions to the genetics, taxonomy and ecology of Drosophila pseudoobscura and its relatives. Carnegie Inst. of Wash. Publ. 554. 183 pp. (Review by **E. Mayr** in [68] 100: 11–12.) **Dobzhansky & Spassky.**—Genetics of natural populations. XI. Manifestations of genetic variations in Drosophila pseudobscura in different environments. [Genetics] 29: 270–90. **Duncan, J.**—Factors affecting the increase in population of the corn borer, Pyrausta nubilalis in 1943. [29] 74: 10–11. **Evans, A. C.**—Observations on the biology and physiology of wireworms of the genus Agriotes. [20] 31: 235–49. **Fano, U.**—Experiments on mutations induced by neutrons in Drosophila melanogaster sperms. [Genetics] 29: 361–69. **Fedotov, D. M.**—Some observations on the internal state of imago of Eurygaster integriceps (Hemiptera). [99] 42: 408–11. **Fisher, Corbet & Williams.**—Relation between the number of species and the number of individuals in a ran-

dom sample of an animal population. [97] 12: 42–58. **Flanders, S. E.**—Uniparentalism in the hymenoptera and its relation to polyploidy. [68] 100: 168–69. **Flanders, S. E.**—(See under Hymenoptera.) **Galvao, Correa & Grieco.**—Alguns dados sobre a manutencao de colonias de Nyssorhynchus em laboratorio. [94] 9: 85–102, ill. **Glass, B.**—Effect of x-rays upon the action of a specific gene in Drosophila melanogaster. [Genetics] 29: 436–46. **Goldschmidt, R. B.**—Parallelism of scalloping and plexation in the wings of Drosophila. [129] 89: 561. **Griswold, G. H.**—Studies on the biology of the webbing clothes moth (*Tineola bisselliella*). [Cornell U. Agr. Exp. Sta.] Memoir 262, pp. 1–59, ill. **Imms, A. D.**—On the constitution of the maxillae and labium of Mecoptera and Diptera. [53] 85: 73–96, ill. **Kettlewell, H. B. D.**—Temperature experiments on the pupae of Heliothis peltigera and Panaxia dominula, with the manifestation of the mendelian law at a given temperature only. [Proc. & Trans. S. London Ent. & Nat. Hist. Soc.] 1943–44: 69–81, ill. **Kosmachevsky, A. S.**—Melolontha larvae as affected by soil humidity. [99] 40: 248–50. **Lewis & Bletchley.**—Emergence rhythm of the dung-fly Scopeuma (= Scatophaga) stercararia. [97] 12: 11–18. **Light, S. F.**—Experimental studies on ectohormonal control of the development of supplementary reproductives in the termite gen. Zootermopsis. [Univ. Cal. Publ. in Zool.] 43 (17): 413–54, ill. **Losina-Losiusky, L. K.**—Fluctuations in the intensity of breathing in insects as related to temperature and development. [64] 1943: 125–134, [Russian, English summary.] **Michener, C. D.**—Comparative study of the appendages of the eight and ninth abdominal segments of insects. [7] 37: 336–351, ill. **Payne, N. M.**—Growth curves of two coleopterous larvae (Epilachna corrupta) and (Laemopholeus minutus). [129] 89: 551. **Pickles, W.**—Variations in the ground plan of a nest of the ant Tapinoma nigerrima. [97] 12: 109–14. **Rohdendorf, B. B.**—On the evolution of flight in insects. [99] 40: 170–72. **Schneirla, T. C.**—Nomadism in the swarm-raiding army ants as an instance of animal migration. [129] 89: 552. **Sharrer, B.**—Role of the corpora allata in the development of Leucophaea maderae (Orthop.). [129] 89: 539. **Snodgrass, R. E.**—Feeding apparatus of biting and sucking insects affecting man and animals. [Smithsonian Miscl. Coll.] 104 (7): 1–113, ill. **Stunkard, H. W.**—Studies on the life history of the oribatid mite

Galumna sp., intermediate host of Moniezia expansa. [129] 89: 550. **Thorpe, W. H.**—Types of learning in insects and other arthropods. [Brit. Jour. Psychol., Gen. Sect.] 33: 220–34; 34: 20–31, 66–76, 1943–44. Review by **G. E. Hutchinson** in [Amer. Scientist] 32: 291. **Villee, C. A.**—Phenogenetic studies of the aristapedia alleles of Drosophila pseudoobscura. [129] 89: 562. **Williams, J. L.**—The comparative anatomy of the internal genitalia of psychid moths. [57] 75: 251–60, ill. **Wishart, G.**—An increase in the multiple generation of the European corn borer in Ontario and its relation to parasite establishment. [29] 74: 11–13. **Wulff & Jahn.**—Correlation of electrical and chemical changes in the dark-adapted insect eye. [129] 89: 544. **Zee & Pai.**—Corpus allatum and corpus cardiacum in Chironomus sp. [90] 78: 472–80.

ARACHNIDA AND MYRIOPODA—Baker, E. W.—Tideidos Mexicanos (Acarina: Tydeidae). [35] 5: 73–82, ill. (*). **Carl, J.**—K. W. Verhoeff's system der Siphonophoriden; kritisch betrachtet. [Rev. Suisse Zool.] 51: 253–65, ill. **Chamberlin, R. V.**—Some records and descr. of Amer. Diplopods. [95] 56: 143–52, ill. (*). **Chickering, A. M.**—Salticidae (jumping spiders) of Michigan. [Pap. Mich. Acad. Sci. A. & L.] 29: 139–222, ill. (k). **Cooley & Kohls.**—Argasidae of N. Amer, C. Amer. & Cuba. [Amer. Midland Nat.] Mon. 1: 152 pp., ill. **Keifer, H. H.**—Eriophyid studies XIV. [Bull. Dept. Agr. Calif.] 33: 18–38, ill. (*). **Lundblad, O.**—Hydracarinen-fauna Sudbrasiliens u. Paraguays. [K. Svenska Vet-Akad. Handl.] (3) 20, No. 13: 192 pp., ill. (*). **McLean, G.**—Observations on a spider parasite. [Irish Nat. Jour.] 8: 205–7, ill. **Smith, C. N.**—Life history of the tick Ornithodoras coriaceus. [7] 37: 325–335. **Starling, J. H.**—Ecological studies of the Pauropoda of the Duke forest. [27] 14: 291–310. **Tragardh, I.**—Further contributions towards the comparative morphology of the Mesostigmata (Acarina). VI. [83] 34A (20): 10 pp. **Verhoeff, K. W.**—Some Californian Chilognatha. Diplopoda article. 142. [38] 43: 53–70, ill. (*). **Vogelsang, E. V.**—Contribucion al estudio de la parasitologia animal en Venezuela. XV. Acarina de los animales domesticos y salvajes. [46] 3: 51–56, ill. **Wells, F. L.**—Diurnal behavior cycle in spiders. [68] 99 (2582): 513.

THE SMALLER ORDERS—Augustson, G. F.—Flea gen. Thrassis and sylvatic plague, with the descr. of T. brennani n. sp. [17] 30: 237–40. **Banks, N.**—Neuroptera

of northern S. Am. III. [46] 3: 1–35 (*). **Bianchi, F. A.**—Nesothrips Kirk. Supersedes Oedemothrips Bag. [37] 12: 31–38, ill. **Bonet, F.**—Tullberginos de Mexico (Collembola). [35] 5: 51–72, ill. (*). Sobre la clasificación de los Oncopoduridae (Collembola), con descripción de especies nuevas. [An. Esc. Nac. Cien. Biol.] 3: 127–55, ill. **Cable, R. M.**—The Indian rat flea, Xenopsylla cheopis, in Indiana. [Proc. Indiana Acad. Sci.] 52: 201–02. **Carriker, M. A., Jr.**—Studies in Neotropical Mallophaga. IV. [46] 3: 65–104 (*). **Cowley, J.**—Preliminary report on the Odonata collected by S. Feliksiak & Jaczewski in Canada and N. Foundland. [9] 77: 123–24. **Imms, A. D.**—(See under Anatomy.) **Kennedy, C. H.**—The female of Aeshna rufipennis. [7] 37: 372–375, ill. **Kloet & Hincks.**—Nomenclatorial notes on 2 gen. names in Trichoptera. [9] 77: 97. **Robert, A.**—Premier apercu sur les Odonates du comte d'Abitibi. [98] 71: 149–171. **Ross, H. H.**—Caddis flies or Trichoptera of Illinois. [Bull. Ill. Nat. Hist. Surv.] 23: 1–326, ill. (*). **Sommerman, K. M.**—Bionomics of Amapsocus amabilis. [7] 37: 359–364, ill. **Wright, M.**—Notes on dragonflies in the vicinity of New Smyrna Beach, Fla. [39] 27: 35–9. **Wright & Peterson.**—Key to the genera of anisopterous dragonfly nymphs of the U. S. and Canada. [43] 44: 151–56.

ORTHOPTERA—(See also under Special.) **Duck, L. G.**—Bionomics of Schistocerca obscura. [103] 17: 105–119. **Rehn & Rehn.**—Upper Amazonian locust group Hippacres (Acridid). [41] 96: 201–26, ill (*). **Zeuner, F. E.**—The fossil Acrididae. IV. Acrididae incertae sedis and addendum to Catantopinae. [75] (110) 11: 359–83.

HEMIPTERA—Colton, H. S.—Anatomy of the female American lac insect, Tachardiella larrea. [Bull. Mus. No. Ariz.] 21: 24 pp., ill. (See also under Anatomy.) **DeLong, D. M.**—New gen. (Tenucephalus) and sps. of Mexican leafhoppers related to Parabolocratus. [43] 44: 236–37, ill. **Fennah, R. G.**—Nomenclatorial notes on Laternaria, Fulgora, and Delphax. [95] 57: 43–44. **Froeschner, R. C.**—Contributions to a synopsis of the Hemiptera of Missouri. III. Lygaeidae to Nabidae. [119] 31: 638–83, ill. (k). **Harries, F. H.**—Differential effects of temperature on the development of the beet leafhopper. [47] 69: 127–35. **Harris, H. M.**—Concerning American Rhopalini (Rhopalid). [43] 19: 99–106, ill. **Hayward, K. J.**—El pulgon amarillo de la cana de azucar (Silpha flava) en Tucuman. [Circ. Esc. Exper. Agr. Tucuman] 125: 8 pp., ill. **Knull,**

D. J.—Notes on leafhoppers with descriptions (Cicadelid). [43] 44: 239–42 (*). **McKenzie, H. L.**—Miscellaneous diaspid scale studies. [Bull. Dept. Agr. Cal.] 33: 53–59, ill. (*). **Oman & Beamer.**—Some n. sps. of Cuerna (Cicadel). [103] 17: 119–20, cont. **Plummer, C. C.**—Cinco nuevos Membracidos de Mexico. [An. Esc. Nac. Cien. Biol.] 3: 155–62, ill. **Tissot & Pepper.**—Two new aphids from Rhododendron and related plants. [39] 27: 21–34, ill.

LEPIDOPTERA—Baker, A. D.—History and distribution of the pea moth, Laspeyresia nigricana in Canada. [29] 74: 29–40. **Comstock, J. A.**—Four Californian moths associated with cat-tails. [38] 43: 81–83. **Comstock, W. P.**—Insects of Porto Rico and the Virgin Islands. Lepidoptera: Rhopalocera Papilionoidea and Hesperioidea. [Sci. Surv. P. R. & Virg. Isl.] 12: 421–622, ill. (*). **Comstock & Dammers.**—Larva & pupa of Arzama gargantula. [38] 43: 84–85, ill. **Dethier, V. G.**—Observations on the life history of Cucullia asteroidea. [4] 76: 161–2, ill. **Griswold, G. H.**—(See under Anatomy.) **Lichy, R.**—Sur une ♀ inconnue d'un sphingide tres rare du Venezuela. [46] 3: 57–63. **McDunnough, J.**—New microlepidoptera with notes (Eucosomid). [4] 76: 153–56. **Rippon, C.**—Rearing of lepidoptera. [Proc. & Trans. S. London Ent. & Nat. Hist. Soc.] 1943–44: 40–44. **Turner, H. J.**—Observations on lepidoptera in a little known area of S. Amer. (A review). [21] 56: 80–82. **Warren, B. C. S.**—Review of the classification of the Argynnidi, with a systematic revision of the gen. Boloria (Nymphalid). [36] 94: 1–102, ill. **Williams, J. L.**—(See under Anatomy.) **Wiltshire, E. P.**—Studies in the geography of lepidoptera. [21] 56: 73–74.

DIPTERA—(See also under Special.) **Alexander, C. P.**—New nearctic craneflies. Part XXI. [4] 76: 166–72. Tipulidae nuevos o poco conocidos de Venezuela. [46] 3: 35–50, ill. New or little known Tipulidae LXX. Neotropical sps. [75] (11) 11: 284–311. **Beltrán, E.**—Correct names of parasites in human malaria. [68] 100: 384–85. **Bridges, C. B.**—(See under General.) **Brues, C. T.**—Generic name of the sand fly (Phlebotomus). [68] 99 (2578): 427. **Correa & Cerqueira.**—Descricao de Anopheles (Kerteszia) laneanus, n. esp. de anofelino de campos do Jordao. [94] 9: 111–17, ill. (S). **Correa & Ramos.**—Notas sobre o estudo da biologia do A. tarsimaculatus em Caraguatatuba. [94] 9: 105–108. Contribuicao ao conhecimento da distribuicao geografica dos anofelinos do Estado de S. Paulo.

[94] 9: 127–51. **Dobzhansky & Epling.**—(See under Physiology.) **Dorer, Bickley & Nicholson.**—Annotated list of the mosquitoes of Virginia. [Mosquito News] 4: 48–50. **Dorsey, C. K.**—(See under General.) **Goffe, E. R.**—Leiota, 1857 & Chalcomyia 1885 (Syrphid). [8] 80: 187. On subdiving the gen. Epistrophe as used by Sack (in Lindner, 1830). (Syrp.) [9] 77: 135–40. **Hardy, D. E.**—New Pseudatrichia from Brazil. [103] 17: 104–5, ill. **Hassan, A. A. G.**—Structure and mechanism of the spiracular regulatory apparatus in adult diptera and certain other groups of insects. [36] 94: 103–53, ill. **Hayward, K. J.**—Las moscas de las frutas en Tucuman. [Est. Exper. Agr. Tucuman. Circular] 126: 10 pp., ill. **Hemming, F.**—Generic name of the sand fly. [68] 100: 385. **Imms, A. D.**—(See under Anatomy.) **Reinhard, H. J.**—New N.A. Tachinidae belonging to the G. Muscopteryx. [7] 37: 352–358 (k). **Rozeboom, L. E.**—Phlebotomus limai in the U. S. [17] 30: 274–5. **Sabrosky & Usinger.**—Nomenclature of the human malaria parasites. [68] 100: 190. **Schoof & Ashton.**—Notes and new distribution records on the mosquitoes of North Carolina. [80] 60: 1–10. **Soper & Wilson.**—Anopheles gambiae in Brazil, 1930–1940. 262 pp., 75 figs. New York: The Rockefeller Fdn. (Review by **L. E. Rozeboom** in [68] 99 (2579): 451–52. **Stage, H. H.**—References to literature of interest to mosquito control workers. [Mosquito News] 4: 55–61. Bibliography references to literature of interest to mosquito control workers. [Mosquito News] 4: 94–101. **Stone, A.**—Some relationships of Anopheles lungae (Culic.). [91] 34: 273. **Wainwright, C. J.**—Case of abnormal chaetotaxy in the Muscidae. [8] 80: 185–86.

COLEPTERA—Balfour-Brown, J.—New names and n. sps. in the Dytiscidae. [75] (11) 11: 345–59. Wing venation of the Adephaga, with special reference to the Hydradephaga and some homologies with the Polyphaga. [Jour. Roy. Micr. Soc.] 63: 55–58. **Blackwelder, R. E.**—Checklist of the coleopterous insects of Mexico, C. America and the West Indies, and S. Amer., pt. 2. [Bul. U. S. Nat. Mus.] 189–341. **Bolivar y Pieltain, C.**—Nuevos datos sobre Paratrechus mexicanos y acerca de la variabilidad alar de algunas especies (Carab). [An. Esc. Nac. Cien. Biol.] 3: 163–78, ill. **Bridwell, J. C.**—New Amblycerus affecting seeds of Prosopis chilensis in Puerto Rica & Hispaniola (Bruchid). [Jour. Agr. Univ. P. Rico] 27: 133–35, 1943. **Evans, A. C.**—(See under Physiology.) **Fiedler, C.**—Neue Sudamerikanische Conotrachelus aus der sammlung Chev-

rolat's in Reichsmuseum in Stockholm (Curcul). [83] 35A (6): 63 pp. **Fisher, W. S.**—New sp. of Phloeonemus from Puerto Rico (Colydid). [Jour. Agr. Univ. P. Rico] 27: 131–132, 1943. **Hicks, S. D.**—Notes on some species of Coleoptera taken at Ojibway, Essex County, Ont. [4] 76: 163. **Hincks, W. D.**—Notes on Byturus (Byturid). [8] 80: 178–80. **Hughes, J. H.**—List of Chrysomelidae known to occur in Ohio. [43] 44: 129–42. **Marshall, M. Y.**—New Tanaops from New Mexico with some notes on the genus (Melyrid). [4] 76: 164–66. **Rex, E. G.**—Asiatic beetle in New Jersey. Information on the Japanese beetle. [New Jersey Dept. Agr.] Circ. 348: 18 pp., ill.; Circ. 349: 34 pp., ill. **Saylor, L. W.**—Revision of the rorulenta group of the scarab beetle gen. Phyllophaga. [95] 56: 129–42, ill. (S*). **Todd, A. C.**—Two new nematodes from the aquatic beetle Hydrous triangularis. [17] 30: 269–72. **Van Dyke, E. C.**—Review of the subgenera Stenocantharis and Neocychrus of the genus Scaphinotus (Carab). [70] 24: 1–19, ill. (k).

HYMENOPTERA—(See also under Special.) **Bequaert, J. C.**—Social Vespidae of the Guianas, particularly of British Guiana. [26] 94: 249–304, ill. **Clancy, D. W.**—Biology of Allotropa burrelli, a gregarious parasite of Pseudococcus comstocki. [47] 69: 159–67, ill. **Dreisbach, R. R.**—Thread-waisted wasps of Michigan, with keys and distribution. [Pap. Mich. Acad. Sci. A. & L.] 29: 265–75. **Flanders, S. E.**—Observations on Comperiella bifasciata, an endoparasite of diaspine coccids. [7] 37: 365–371, ill. **Fullaway, D. T.**—Description of a new mymarid egg parasite collected at Los Mochis, Sinaloa, Mex. [37] 12: 57. **Gahan, A. B.**—New encyrtid parasitic in eggs of Hesperiidae. [Jour. Agr. Univ. P. Rico] 27: 137–39, 1943 (S). **Morris, R. L.**—An annotated list of ants from Indiana. [Proc. Indiana Acad. Sci.] 52: 203–24. **Niblett, M.**—Cynipid gen. Rhodites. [Proc. & Trans. S. London Ent. & Nat. Hist. Soc.] 1943–44: 50–54. **Schneirla, T. C.**—(See under Physiology.) **Scott, T. L.**—Bee anatomy. [Microscope] 5: 196–204, ill. **Walley, G. S.**—Campoplegine notes and descriptions (Ichneum). [4] 76: 157–61. **Will, H. C.**—Notes and news on sawfly larvae in Pennsylvania. [Proc. Penn. Acad. Sci.] 18: 48–49. **Williams, J. L.**—Hymenopterous parasites obtained from stored cases of Eurukuttarus confederata collected in Chester County Penna. (Psychid). [Proc. Penna. Acad. Sci.] 18: 50–51. **Windsor, A. S.**—Ant annotations: Random seasonal notes on ants. [Turtox News] 22: 114–15.

SPECIAL—On the desirability of universities including zoological nomenclature in their courses of general and systematic zoology. [87] 1: 65–71. The meaning of the "indication" in proviso (a) to Art. 25 of Intern. Code, as respects names published on or before 31 Dec. 1930. [87] 1: 73–86. Nature of a systemmatic name. [87] 1: 87–94. Status of publications dated 1758. [87] 1: 95–102. On the importance of forming specialist groups for the study of the nomenclature of particular divisions of the animal kingdom. [87] 2: i–vii. On the need for a clear indication in the description of new gen. & sps. of the order and family involved. [87] 2: ix–xvi. On the status of the names Lasius Panz., Podalirius Latr., Lasius Fab. and Anthophora Lat. (Hym.). [87] 2: 169–80. On the status of the gen. names in the order Diptera first published in 1800 by J. W. Meigen in his Nouv. Class. Mouches a deux ailes. [87] 2: 181–96. On the question of breaches of the Code of Ethics. [87] 2: xvii–xxiv. On the status of the names Bethylis Latr., & Dryinus Latr. (Hym.). [87] 2: 197–208. On the status of the names Phaneroptera Serv. & Tylopsis Fieb. (Orth.). [87] 2: 209–226. On the status of the names Callimome Spin., Misocampe Latr. & Torymus Dalm. (Hym.). [87] 2: 227–238.

LIST OF JOURNALS CITED

4.—Canadian Entomol. 7.—Ann. Entom. Soc. America. 8.—Entom. Monthly Mag. 9.—The Entomologist, London. 13.—Jour. Entom. & Zool. 17.—Jour. of Parasitology. 20.—Annals of Appl. Biology. 21.—Entom. Record & Jour. Variation. 26.—Bull. Mus. Comparative Zool. 27.—Ecological Monographs. 29.—Ann Rept. Ent. Soc. Ontario. 35.—Rev. Soc. Mexicana Hist. Nat. 36.—Trans. R. Entom. Soc. London. 37.—Proc. Hawaiian Ent. Soc. 38.—Bull. So. Calif. Acad. Sci. 39.—Florida Entomologist. 41.—Proc. Acad. Nat. Sci. Phila. 43.—Ohio Jour. Sciences. 46.—Bol. Entom. Venezolana. 47.—Jour. Agr. Research. 53.—Quart. Jour. Microscop. Sci. 64.—Bull. Acad. Sci. URSS., Biol. Ser. 68.—Science, New York. 70.—Entom. Americana. 75.—Annals & Mag. Nat. Hist. 80.—Jour. Elisha Mitchell Sci. Soc. 84.—Ecology, Brooklyn. 90.—American Nat. 91.—Jour. Washington Acad. Sci. 94.—Arq. Hig. Saude Pub., S. Paulo. 95.—Proc. Biolog. Soc. Wash. 97.—Jour. Animal Ecology. 98.—Le Natural. Canadien. 99.—C. R. (Doklady), Acad. Sci. URSS. (N. Ser.). 103.—Jour. Kansas Entom. Soc. 119.—Amer. Midland Nat. 129.—Anatomical Record.

INDEX TO VOLUME LV

(* Indicates new genera, species, names, etc.)

ALEXANDER, C. P. Undescribed species of crane-flies from the eastern United States and Canada (Dipt.: Tipulidae). Part VIII 125
Undescribed species of crane-flies from the Eastern United States and Canada (Dipt.: Tipulidae). Part IX 241
BENESH, B. A new Dorcas from Mexico (Coleop.: Lucanidae) 45
Esplanate versus Explanate 66
BLEVINS, T. B. (See under Dawson)
BROWN, J. H. Sylvatic plague: the recovery of fleas from the burrowing owl and its burrow in a plague area in Alberta 15
CALDWELL, J. S. Notes on Oecleus Stal (Homoptera: Ciciidae) 175, 198
CARTWRIGHT, O. L. New Aphodius from Texas Gopher burrows 129, 146
CHAMBERLIN, R. V. Some centipeds from Georgia 32
Two new centipeds 64
CONANT, R. No joy in an insect-free world 258
CRESSON, E. T., JR. A note on the dates of Loew's Diptera Americae Septentrionalis Indigena 206
DARLINGTON, E. P. Rearing notes on Gracillaria sassafrasella (Chamb.) 40
DAWSON, E. Y. AND T. B. BLEVINS. Some butterflies of the mountains of eastern Arizona 253
DELONG, D. M. Some new Mexican species of Omanana (Homoptera: Cicadellidae) 151
DRAKE, C. J. (See under Harris)
THE EDITORS. Philip P. Calvert—Editor Emeritus 1
Current Entomological Literature
21, 53, 77, 107, 138, 165, 193, 216, 248, 272
FREEMAN, H. A. A new subspecies of Polites themistocles (Latreille) from British Columbia, Canada (Lepidoptera, Rhopalocera, Hesperioidea) 47

Notes on the streckeri group of the genus Megathymus (Lepidoptera, Rhopalocera) 103
FROESCHNER, R. C. Annotations and keys for the Dermaptera of Missouri 181
FROST, S. W. Notes on the habits of Monobia quadridens (Linn.) 10
GARTH, J. S. Butterflies of the Organ Pipe Cactus National Monument, Arizona 119
GROSKIN, H. An observation of a Formica sanguinea raid at Battle Creek, Calhoun County, Michigan (Hymenoptera, Formicidae) 42
GROSKIN, H. Nuptial flight of the ant Prenolepis imparis Say 234
HARRIS, H. M. AND C. J. DRAKE. A second species of Elasmocorinae (Hemiptera, Reduviidae) 85
HARTMAN, C. G. A note on the habits of Trypoxylon politum Say (Hymenoptera: Specidae) 7
HAYES, W. P. A bibliography of keys to immature mosquitoes (Diptera: Culicidae) 141, 183
HEMMING, FRANCIS. Recent work by the International Commission on Zoological Nomenclature 211
HIGGINS, H. G. (See under Mulaik)
HULL, F. M. Some syrphid fly genera (Diptera) 203
Notes upon flies of the genus Solva Walker 263
HUTCHINSON, G. E. As others see us 63
IMMS, A. D. Co-operative measures for locust control ... 169
JEFFERS, W. F. (See Muma & Jeffers)
KENAGA, E. E. Notes on Hadronotus parkeri Fouts (Hymenoptera: Scelionidae) 173
KNULL, D. J. A californian Acinopterus (Homoptera: Cicadellidae) 62
LA RIVERS, I. A summary of the mormon cricket (Anabrus simplex) (Tettigoniidae: Orthoptera) 71, 97
LEECH, H. B. Laccophilus shermani, a new species of water beetle from Arizona and Texas (Coleoptera: Dytiscidae) 4

A few additions and corrections to R. E. Blackwelder's "Checklist of the Coleopterus Insects of Mexico, Central America, the West Indies and South America. Part I" 266
LINSLEY, E. G. The naming of infraspecific categories .. 225
LIU, C. L. Contributions to the knowledge of Chinese Coccinellidae. VI. Occurrence of Perilitus coccinellae (Schrank), a parasite of adult Coccinellidae in Yunnan (Hymenoptera, Braconidae) 235
LYMAN, F. E. Taxonomic notes on Brachycercus lacustris (Needham) (Ephemeroptera) 3
Correction 39
Effect of temperature on the emergence of mayfly imagoes from the subimago stage 113
Notes on emergence, swarming and mating of Hexagenia (Ephemeroptera) 207
MIDDLEKAUFF, W. W. Mounting mosquito larvae 77
MILNE, L. J. [Light-traps and phototropism] 213
MULAIK, S. AND H. G. HIGGINS. A new genus of scorpions in the southwest 237
MUMA, M. H. AND W. F. JEFFERS. Note on unusual nests of Trypoxylon politum Say 50
RAPP, W. F., JR. A new species of Psychoda from New York (Psychodidae, Diptera) 232
RAU, P. The prey and hunting habits of the wasp, Trypoxylon politum Say 9
A note on the rove-beetle, Staphylinus maculosis Grav. 15
The monarch butterfly, Danaus plexippus L., in Mexico 44
Another use for the cockroach, Blatta orientalis 49
The survival of the fittest "ism" 137
A note on Lecontella cancellata Lec. (Coleoptera: Cleridae) in cells of the mud-daubing wasp 197
The classification of entomologists 269
REHN, J. A. G. The Rhaphidophorid Tachycines asynamorus Adelung in America (Orthoptera, Gryllacridae, Rhaphidophorinae) 36

On the significance of localized coloration in the creosote bush locust (Bootettix) (Orthoptera; Acrididae; Acridinae) 158
RICHARDS, A. G., JR. Notes and news in entomology 18, 51, 105, 190
An outline of general physiology (book review) 83
Electron micrographs of mosquito microtrichiae 260
Ross, E. S. Arthropod collecting in the burrows of a Texas Pocket-Gopher 57
Onthophilus kirni new species, and two other noteworthy Histeridae from burrows of a Texas Pocket-Gopher 115
SCHWARZ, H. F. Obituary: Frank E. Lutz 29
STALLINGS, D. B. (See under Whittaker)
TUTHILL, L. D. On some Cuban Psyllidae (Homoptera) 93
WEISS, H. B. Gnorimoschema operculella (Zell.) in New Jersey (Lep.) 135
Parasite production by the New Jersey Department of Agriculture 135
A classification of entomologists in 1764 136
[Light-traps and phototropism] 213
Fireflies active in rain 270
Permanent "sleeping" quarters of Chalybion caeruleum (Linn.) 270
An unusual faunistic study 271
WHITE, B. E. A new Scelolyperus and a key to the American species north of Mexico (Coleoptera: Chrysomelidae) 177
WHITTAKER, R. AND D. B. STALLING. Notes on seasonal variation in Lepidoptera 67, 87

GENERAL SUBJECTS

Ant mating flights 234
Ant raids 42
Arthropods in pocket-gopher burrows 57
As others see us 63
Bibliography of mosquito keys 141
Biology of Mayflies 207
Butterfly scales 190
Chicago Natural History Museum 61
Classification of entomologists 136, 269
Conservation and DDT 258
Current Entomological Literature: 21, 53, 77, 107, 138, 165, 193, 216, 248, 272
Cuticle (review) 18
Darwinism 137

Fauna of graves 271
Fauna of sewage beds 105
Field Museum 61
Firefly activity 270
Fishbait, cockroaches 49
Food for birds 76
Food for humans 74
Habits of wasps: 7, 9, 10, 50, 270
Insect coloration 158, 190
Japanese beetle parasites 135
Light production 52
Light-traps and phototropism 52, 213
Locust control 169
Microtrichiae 260
Mormon cricket (review) . 71, 97
Mounting mosquito larvae ... 77
Periodicity in cuticular structures 260
Rockefeller Foundation in 1943 259
Subspecific Groups 51, 67, 158, 169, 225
Sylratic plague in Alberta ... 15
Temperature and emergence .. 113
Terms Esplanate and Explanate 66
Winter quarters for monarch butterfly 44
Zoological Nomenclature, Opinions and Declarations . 211

OBITUARY NOTICES

Beckwith, C. S. 215
Busck, A. 158
Felt, E. P. 35
Gordon, W. M. 86
Junk, W. 215
Lutz, F. E. 29
Poulton, E. B. 18
Sanborn, C. E. 215
Stoner, D. 215

PERSONALS

Banks, N. 216
Calvert, P. P. 1
Cockerell, T. D. A. 216
Daris, W. T. 216
Emerson, A. E. 61
Howard, L. O. 216
MacLeod, G. F. 71
McDunnough 216
Melander, A. L. 14, 216
Needham, J. G. 216
Osborn, H. 216
Seevers, C. H. 61
Smith, R. C. 102
Snodgrass, R. E. 216
Wyatt, A. K. 61

GEOGRAPHICAL DISTRIBUTION

Alabama: Lepid. 91
Arizona: Arachnid. 238; Col. 4; Lepid. 88, 89, 103, 119, 253
Arkansas: Lepid. 88, 89
British Columbia: Lepid. 47
California: Arachnid. 238; Hom. 62; Orth. 71
Colorado: Orth. 71
Florida: Lepid. 89
Georgia: Centiped 32; Dipt. 125, 127; Lepid. 89, 91
Idaho: Orth. 71
Illinois: Lepid. 91; Orth. 39
Iowa: Orth. 39
Kansas: Orth. 72; Lepid. 87, 88, 89, 91, 92
Kentucky: Dipter. 243
Louisiana: Dipt. 245
Michigan: Ephem. 3
Minnesota: Orth. 39, 72
Mississippi: Dipt. .. 263, 264, 265
Missouri: Derm. 181; Lepid. 88
Montana: Orth. 71
Nebraska: Orth. 72
Nevada: Orth. 71
New Jersey: Lepid. 135
New Mexico: Lepid. 103; Orth. 71
New York: Dipt. 233; Orth. 39
North Carolina: Dipt. 129

North Dakota: Orth. 39, 72
Ohio: Orth. 39
Oklahoma: Lepid. 89
Oregon: Orth. 71
Pennsylvania: Orth. 39
South Dakota: Dipt. 241; Orth. 39, 72
Tennessee: Orth. 39
Texas: Arthrop. 60; Col. 4, 60, 115, 118, 130, 131, 133, 146, 147, 149, 150, 178; Lepid. 88, 89, 92, 103, 104
Utah: Lepid. 103; Orth. 71
Washington: Orth. 71
West Virginia: Dipt. 243
Wisconsin: Orth. 39
Wyoming: Orth. 71
Mexico: Col. 45, 266; Hom. 151, 152, 153, 154, 155, 175, 176; Lepid. 87, 89
Central America: Hom. 175
South America: Hem. 85
West Indies: Hom. 93

COLEOPTERA

acuminatus, Aphodius* 133
addenda, Deronectes 266
amandus, Bidessus 266
anisonychus, Rhantus 267
Aphodius 60, 129, 146
atwateri, Aphodius* 149
basillaris, Thermonetus 267
bimarginatus, Hydaticus 267
blakeae, Scelolyperus* 178
captivus, Aphodius* 147
Chaetarthria 268
chevrolati, Copelatus 267
cinctellus, Bidessus 266
Corrections to neotropical checklist 266
cyanellus, Scelolyperus 178
debilis, Paracymus 268
decipiens, Laccophilus 5
decipiens, Scelolyperus 178
dispersa, Desmopachria 266
Dorcas 45
dorsalis, Cymbiodyta 268
elliptica, Cybister 267
ellipticus, Tropisternus 267
estriatum, Phaenonotum 268
Fauna in graves 271
flaviceps, Scelolyperus 177
flavicollis, Scelolyperus 177
flavogriseus, Rhantus 267
floridanus, Spilodiscus 118
fraternus, Hygrotus 266
funerea, Deronectes 266
Geomysaprinus 118
gloveri, Spilodiscus 60, 118
goffi, Geomysaprinus 60, 118
graptoderoides, Scelolyperus .. 178
hauseri, Macronaemia 236
hoplites, Berosus 267
infuscatus, Berosus 267
In pocket-gopher burrows 57
interruptus, Ochthebius 267
kirni, Aphodius* 131
kirni, Onthophilus* 115
*Laccophilus** 4
laevis, Tropisternus 267
lecontei, Helophorus 267
levis, Canthydrus 266
lineatus, Canthydrus 266
longulus, Scelolyperus 178
loripes, Scelolyperus 177
maculicollis, Helochares 268
maculicollis, Scelolyperus 177, 178
maculosis, Staphylinus 15
marginellus, Photinus 270
mexicanus, Dorcas* 45
normatus, Helochares 268
Onthophilus 60, 115
peculiosus, Aphodius 150
peninsularis, Thermonetus 267
pennsylvanica, Photuris 270
regularis, Agabus 267
rossi, Aphodius* 130
rufescens, Cercyon 268
rugosifrons, Geomysaprinus .. 118
rugulosus, Berosus 267

salsamentus, Tropisternus 268
salvini, Berosus 267
Scelolyperus 177
schwarzi, Scelolyperus 178
septempunctata, Coccinella ... 236
sepultus, Aphodius* 146
shermani, Laccophilus* 4
signaticollis, Anacaena 268
Staphylinus 15
stramineus, Berosus 267
striatus, Berosus 267
tejonicus, Scelolyperus 177
variegata, Adonia 236
Water-beetles of Lower Calif. 266

DIPTERA

alternata, Psychoda 107
americana, Solva 265
angustafona, Psychoda* 233
burgessi, Gonomyia 245
*Catacores** 205
crepuscula, Phloophila* 263
cyanea, Axona 205
cyanea, Catacores 205
dakota, Dolichopeza* 241
Dates of Loew's papers 206
elita, Eumacronychia 97
fattigiana, Tipula* 125
Fauna in graves 271
gambiae, Anopheles 259
In pocket-gopher burrows 57
Keys to mosquito larvae . 141, 183
Limnophila 127
Metriocnemus 106
Nomenclatorial decisions 211
opacea, Syrittosyrphus* 203
pallipes, Phloophila 265
*Phloophila** 263
phorophragma, Limnophila* .. 127
Psychoda 106, 232
pygmea, Phloophila* 264
quadrimaculatus, Anopheles .. 260
shelfordi, Limonia 243
Solva 263
Spaniotoma 106
*Syrittosyrphus** 203
tergata, Euaraba 97
Tipula 125
tuberosa, Sarcophaga 98

HEMIPTERA

comptus, Elasmocoris* 85
Elasmocoris 85
fasciatus, Oncopeltes 173
In pocket-gopher burrows 57
kalmii, Lygaeus 173

HOMOPTERA

Acinopterus 62
apicatus, Oecleus* 176
apterapunctatus, Oecleus* 198
arcata, Omanana* 154
bifurcata, Omanana* 152
campestris, Oecleus 202
cephalicus, Oecleus* 200
Ceropsylla 93
*Coelocara** 93
concinnus, Oecleus 198
constrictus, Oecleus* 199
decens, Oecleus 176
delongi, Oecleus* 199
distincta, Heteropsylla* 96
divergens, Omanana* 153
dubius, Oecleus* 175
duodens, Omanana* 151
ernstii, Coelocara 93
Heteropsylla 96
infuscatus, Oecleus* 198
Katacephala 93
mediana, Omanana* 154
minimus, Oecleus 198
morongoensis, Acinopterus* .. 62
Oecleus 174, 198
Omanana 151
parallelus, Oecleus* 176
pellucens, Oecleus 175
quinquelineatus, Oecleus* 200
seminiger, Oecleus 175
sideroxyli, Ceropsylla 93
spatulatus, Oecleus* 200

*tenuipennis,** *Katacephala* 93
*torquea,** *Omanana* 156
tortolita, Omanana 155

HYMENOPTERA

ancylivorus, Macrocentrus 135, 136
caeruleum, Chalybion 270
coccinellae, Perilitus 235
Formica 42
fusca, Formica 42
fuscipennis, Microplectron ... 135
Hadronotus 173
imparis, Prenolepis 234
laeviventris, Chlorion . 77, 87, 100
Monobia 10
Nomenclatorial decisions 211
parkeri, Hadronotus 173
Perilitus 235
politum, Trypoxylon 7, 9, 50
Prenolepis 234
pulla, Stictiella 98
quadridens, Monobia 10
sanguinea, Formica 42
Trypoxylon 7, 9, 50
unicinctus, Stizoides 97

LEPIDOPTERA

aidea, Anaea 255
albescens, Pyrgus 124
albocincta, Megathymus 105
albofasciatus, Chiodes 254
alexandra, Colias 257
Amateur butterfly collectors .. 63
amyntas, Polygonus 257
antonia, Asterocampa 253
apama, Callophrys 255, 256
aquilo, Plebeius 257
arizonensis, Lycaenopsis . 123, 254
astyanax, Basilarchia 254, 255, 256
aurantiaca, Copaeodes ... 124, 254
bachmanii, Libythea 123, 254
bellus, Amblyscirtes 255
boisduvaliana, Eurema 90
bredowii, Heterochroa .. 255, 256
caesonia, Zerene 120
californica, Chlosyne 122
cassus, Amblyscirtes 255, 256
cellus, Cercopterus 256
celtis, Asterocampa 122
ceos, Pholisora 124, 253
charon, Minios 257
chrysalus, Hypaurotis ... 255, 256
chrysotheme, Colias 51
claudia, Euptoieta .. 255, 256, 257
Colias 51, 63
cypris, Morpho 190
daira, Eurema 89
Danaus 44
daunus, Papilio 119, 255, 256, 257
Desmia 11
deva, Atrytonopsis 256
draco, Polites 257
eriphyle, Colias 51
Eurema 67, 89
eurynome, Argynnis 257
eurytheme, Colias 51
exoteria, Amblyscirtes 255
fulvia, Melitaea 121
funeralis, Desmia 11
garita, Oarisma 257
gossypiella, Platyedra 52
Gracillaria 40
halesus, Atlides 123, 253
henshawi, Neonympha ... 254, 255
hermosa, Euphydryas 120
icarioides, Plebeius 256
*immaculata,** *Eurema* 88
In pocket-gopher burrows 57
iole, Nathalis 120, 256
isola, Hemiargus 254
lacinia, Chlosyne 256
leda, Strymon 254
leussleri, Megathymus 104
lisa, Eurema 90
lunus, Atrytonopsis 254
lydia, Eurema 89
lygdamus, Glaucopsyche 256
magdalena, Euphydryas 257
marina, Leptotes 123, 254

Megathymus 103
mexicana, Eurema 87, 90, 120, 254, 255, 256
mormo, Apodemia 254
Morpho 190
mylitta, Phyciodes 257
nais, Apodemia 255, 256
napi, Pieris 256, 257
Nathalis 91
nausicaa, Argynnis 257
nessus, Celotes 254
nevada, Hesperia 257
nicippe, Eurema 90, 120
Nomenclatorial decisions 211
nycteis, Phyciodes 257
ochracea, Coenonympha 257
operculella, Gnorimoschema .. 135
oslari, Strymon 254
pacuvius, Erynnis 255
pahaska, Hesperia 256
pallens, Eurema* 88
palmerii, Apodemia 253
palmyra, Eurema 89
perse, Melitaea 253
persius, Erynnis 257
philenor, Papilio 119
philodice, Colias 51
picta, Phyciodes 255
pirus, Butleria 256
Platyedra 52
plexippus, Danaus 44
pola, Melitaea 257
polingii, Butleria 255, 257
Polites 47
Precis 90
proterpia, Eurema 90
pseudargiolus, Lycaenopsis ... 256
pseudocellus, Cercopterus 256
pulverulenta, Antigonus . 124, 253
pylades, Thorybes 255
quaderna, Erora 255, 256
rita, Philotes 123
rosa, Eurema* 87
rosa, Precis* 91
rubricata, Megisto 254, 255
rutulus, Papilio 257
sassafrasella, Gracillaria 40
siva, Mitoura 257
spinatorum, Mitoura 257
streckeri, Megathymus 103
strigosa, Danaus 120, 253
taxiles, Poanes 255, 256
terlootii, Neophasia 255
texana, Anthanassa . 122, 253, 255
texana, Megathymus 104
theona, Melitaea 256
turneri, Polites 47
uncas, Hesperia 256
viridis, Nathalis* 92
weidemeyerii, Basilarchia 255, 256
xicaque, Paramecera 255
Zerene 69

ORTHOPTERA

americana, Schistocerca 171
Anabrus 71, 97
argentatus, Bootettix 160
asynamorus, Tachysines 36
Blatta 49
Bootettix 158
Diestrammena 36
gregaria, Schistocerca 170
In pocket-gopher burrows 57
marmorata, Diestrammena ... 36
maroccanus, Dociostaurus 170
mexicanus, Melanoplus 171
migratoria, Locusta 170
Nomenclatorial decisions 212
orientalis, Blatta 49
paranensis, Schistocerca 170
punctatus, Bootettix 160
simplex, Anabrus 71, 97
spretus, Melanoplus 171
Tachycines 36

SMALLER ORDERS

aculeatum, Doru 182, 183
affiliata, Hexagenia 207

bicolor, Ephemerella 114
Biology of *Hexagenia* 207
Brachycercus 3
brunneipennis, Vostox ... 181, 182
Doru 182
Ephemerella 3, 114
Eurycaenis 3
Fauna in graves 271
femoratum, Stenonema 114
Hexagenia 115, 207
idei, Brachycercus 3
In pocket-gopher burrows 57
interpunctatum, Stenonema .. 114
Labia 181
lacustris, Brachycercus 3
limbata, Hexagenia 207
minor, Labia 181, 182
nitidus, Eurycaenis 3
Owl fleas, Alberta 15
rigida, Hexagenia 207
Stenonema 113
temporalis, Ephemerella ... 3, 114
tripunctatum, Stenonema 113
Vostox 181

NON-HEXAPODA

anastera, Eustala 10
australis, Nipponobius* 64
benjaminus, Neoscona 9
Centipeds from Georgia 32
coarctatus, Kiricephalus 52
desertorum, Diplops* 238
*Diplops** 237
domiciliorum, Epeira 10
Epeira 10
Eustala 10
Fauna in graves 271
georgiae, Georgibius* 34
*Georgibius** 34
*Gomphor** 64
hadleyi, Gomphor* 65
In pocket-gopher burrows 57
Kiricephalus 52
Neoscona 9
Nipponobius 64
parvula, Epeira 10
paurops, Sozibius* 33
prompta, Epeira 10
Sozibius 33

Literature for sale: Fifty years accumulation of Smithsonian, National and other museum, societies and other publication, including insects. Large library of books on travel, exploration, big game hunting, much natural history, in many lands. Price lists on request. J. Alden Loring, Box E–N, Owego, New

---

EXCHANGES

This column is intended only for wants and exchanges, not for advertisements of goods for sale or services rendered. Notices not exceeding three lines free to subscribers.

These notices are continued as long as our limited space will allow; the new ones are added at the end of the column, and, only when necessary those at the top (being longest in) are discontinued.

Wanted—Specimens of the genus Calendra (Sphenophorus) from North America. Will exchange Eastern U. S. Calendra or other Coleoptera for desired species. R. C. Casselberry, 302 Lincoln Avenue, Lansdowne, Penna.

Coccinellidae wanted from all parts of the world, especially South and Central America. Buy or exchange. G. H. Dieke, 1101 Argonne Drive, Baltimore, Md.

Coleoptera—Will exchange mounted and labeled specimens from North America. All groups except Rhynchophora. G. P. Mackenzie, 1284 Sherwood Road, San Marino, Calif.

Lepidoptera—Should like to hear from collectors interested in species from central Alberta and Saskatchewan. Would collect other Orders. Paul F. Bruggemann, R. R. 1, Furness, Sask., Canada.

Lampyridae of U. S. and Canada wanted from the South and West, especially Photinus and Pyractomena for revisional study. Buy or exchange. J. W. Green, R. D. 2, Easton, Pa.

Lepidoptera—Would like to exchange Californian butterflies, noctuids, geometrids, etc. for eastern specimens. Glenn E. Pollard, 500 Clark Drive, San Mateo, Calif.

Lepidoptera—Am still collecting here and have only fine specimens for exchange. H. W. Eustis, Woodbine Rd., Augusta, Ga.

JUST PUBLISHED

A CATALOGUE AND RECLASSIFICATION OF THE NEARCTIC ICHNEUMONIDAE

(HYMENOPTERA)

By HENRY K. TOWNES, JR.

(Memoirs of the American Entomological Society, Number 11)

The parasitic habits of this group of insects render them of great economic importance and biological interest, but because of the handicaps of an extremely scattered literature and confused taxonomy, a vast amount of preparation is required of the prospective worker, if his results are to be of lasting value.

This catalogue is a coherent guide to the published information and thereby opens the field to more and a better class of research. It gives a more natural systematic arrangement than has previously been available, a bibliography, and a list of the host and parasites of the described ichneumon-flies which occur in America north of Mexico, complete through the year 1940.

The price of this work, in two parts (about 800 pages), is $15.00 postpaid. Remittance should accompany order. Part I is ready for delivery and part II should be ready within the next three months but will be sent only when payment covering entire work has been received.

Important Mosquito Works

MOSQUITO ATLAS. Part I. The Nearctic Anopheles, important malarial vectors of the Americas, and Aedes aegypti and Culex quinquefasciata

MOSQUITO ATLAS. Part II. The more important malaria vectors of the Old World: Europe, Asia, Africa and South Pacific region

By Edward S. Ross and H. Radclyffe Roberts

Price, 60 cents each (U. S. Currency) with order, postpaid within the United States; 65 cents, foreign.

KEYS TO THE ANOPHELINE MOSQUITOES OF THE WORLD

With notes on their Identification, Distribution, Biology and Relation to Malaria. By Paul F. Russell, Lloyd E. Rozeboom and Alan Stone

Mailed on receipt of price, $2.00 U. S. Currency. Foreign delivery $2.10.

For sale by the American Entomological Society, 1900 Race Street, Philadelphia 3, Pa., U. S. A.